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De Quelques Hyperostoses de Poissons Trouvées dans les Grottes Quaternaires de Menton en Italie par E. Rivière. Assoc. Franc. pour l'Advanc. des Sci., Congrès de Montpellier, 1879. pp. 6. From the author.

Orographie de la partie des Hautes-Alpes Calcaires. By E. Renevier. 12mo, pp. 97. Lausanne, 1880. From the author.

Quelques Roches des Alps Vaudoises Etudiées au microscope. Par M. Arthur Wm. Waters. (Bull. Soc. Vaud. Sc. Nat. 16, 83.) pp. 6, pl. 1. From E. Renevier.

Zur Fisch-fauna des Cauca und der Flüsse bei Guayaquil. Von Dr. Franz Steindachner. 4to, pp. 52, pls. 9. Wien, 1880. From the author.

Ichthyologische Beiträge (IX). Von Dr. Franz Steindachner. Über eine Sammlung von Flussfischen von Tohrzona auf Madagascar. (Sitzb. der k. Akad. der Wissensch. 1, Abth. Juli-Heft. Jahrg. 1880.) pp. 29. From the author.

Anales del Ministerio de Fomento de la República Mexicana. 8vo, Tomo III, pp. 687. Mexico, 1880.

Circular of the Terzo Congresso Geografico Internazionale. Venezia, 1881. Roma, 1880. From the secretary.

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GENERAL NOTES.

BOTANY.

MECHANICAL CAUSE OF QUINCUNCIAL PHYLLOTAXY.—In a preliminary note on this subject, Prof. F. Delpino, of the Royal University of Genoa, describes the following experiment by which he has reached certain conclusions concerning phyllotaxy different from those usually adopted. Thirty or forty small spheres of equal diameter are fastened together as follows: the first, second and third are in contact; the fourth lies in the angle between them; the fifth is in the angle between the second, third and fourth; the sixth is in the angle between the third, fourth and fifth; and so on, each additional ball being placed in the angle between the three immediately preceding it in number. On the cylindroid thus formed the spheres occupy positions corresponding to those of the leaves in the quincuncial arrangement. Three spirals may be traced, having the formulæ $\frac{1}{1}$, $\frac{1}{2}$, $\frac{1}{3}$. Imagine now the spheres as thus placed to elongate gradually into horizontal cylinders, and the spirals will change successively to $\frac{1}{2}$, $\frac{1}{3}$, $\frac{2}{5}$; $\frac{1}{3}$, $\frac{2}{5}$, $\frac{3}{8}$; $\frac{2}{5}$, $\frac{3}{8}$, $\frac{5}{13}$; &c. His conclusions are that the cause of the quincuncial arrangement is exclusively mechanical; that the orthostichous and retiseriate arrangements are not due solely to mechanical causes, but are influenced by physiological, biological and hereditary circumstances; that leaves are not peripheral and lateral, but central and apical in their origin; that the cauline system does not exist, what has been considered such being only a congenital fusion of the bases of an indeterminate number of leaves, and merely a region which he proposes to call the phyllopodium or phyllopodial region; that the structural principle governing the formation of the body (corpo) in the higher cryptogams, gymnosperms and angiosperms is the simplest possible, being a continued, more or less purely mechanical, ascendant apposition of similar organs; that the higher plants are phyllo-

phytes, and not cormophytes, the only true cormophytes being certain algæ (*Caulerpa*, *Chara*); and that the leaf has the same structural significance in the phænogams and higher cryptogams, but that there is nothing in the lower cryptogams which corresponds to it.—*W. T.*

INFLUENCE OF HIGH AND MOIST TEMPERATURES ON GERMINATION.—The action of high and moist temperatures on germination has been recently studied by M. Hackel, who put seeds of black mustard (*Sinapis nigra*) on a moist sponge placed in a plate whose bottom was constantly covered with water, and kept the whole in a stove with constant temperature at 48° C. In less than twelve hours radicles were formed in a large number of the seeds (but none such were observed in seeds in the water kept there—they never generated). The seeds, having sent out their radicle, stopped while the temperature remained at 48° , but when it was lowered to 20° or (better) 17.5° , there was a rapid development of germs. Neither *Sinapis alba* nor *Lepidium sativum* gave a reproduction of the phenomenon. The substances, benzoate of soda (known to arrest the development of ferments), benzoic acid and sulphurous acid, were proved to be capable of suspending the germination of various seeds.—*English Mechanic.*

NECTAR, ITS NATURE, OCCURRENCE AND USES.—Under this heading Mr. William Trelease contributes to the report on Cotton insects lately issued by the Agricultural Department, an interesting essay, accompanied by a good plate and full bibliographical references. He concludes that "nectar, whenever it occurs, may be considered as excretory, reproductive, protective or nutritive; that in some cases, *e. g.*, the leaves of the peach, excretory nectar may possibly be protective also; that reproductive nectar usually occurs in the flowers but not always; that protective nectar seems, in some cases, designed to keep ants from defoliating and deflowering the plant; in others, to keep larvæ from destroying the foliage or immature fruit; that nutritive nectar may serve, in some cases, to lead to the capture of wingless, in others of winged insects, and finally that the vital force of a plant is taxed so little in the production of nectar, that glands once developed and endowed with the power of active secretion may continue to secrete for generations after the necessity for their secretion has ceased to exist.

BOTANICAL NOTES.—At the Swansea meeting of the British Association, Mr. Alfred W. Bennett, in a paper on the classification of the Cryptogams, proposed to retain Sach's class of Protophyta for the lowest forms of vegetable life; but to restore the primary division of the remainder of thallophytes into Fungi and Algæ, as being more convenient to the student, and at least as much in accordance with probable genetic affinities. He also, with Mr. G. Murray, read an essay on "a reformed system of ter-

minology of the reproductive organs of the Cryptogamia."—At a recent meeting of the French Academy, M. Planchon described a new species of American vine under the name of *Vitis berlandieri*.—Messrs. E. A. Rau and A. B. Hervey have issued a Catalogue of North American Musci, giving the names of the species and the general localities.—A valuable contribution to the subject of insect-destroying Fungi has been published by Prof. A. Giard. Of these the most common is *Entomophthora muscæ*, so common in September and October in our apartments; a second type is *E. megaspermum*, a parasite of the cut-worm or larva of *Agrotis segetum*; others are *E. curvispora*, a parasite of *Simulium latipes*, a species of black fly, and *E. ovispora*, parasite of another fly (*Lonchæa vaginalis*). He regards Empusa and Tarichium as simply forms of Entomophthora, and to be used in the same sense as in zoölogy the nauplius or zoëa of a Crustacean. He describes as new a fungus parasite of the flesh fly, under the name of *Entomophthora calliphoræ*. He then describes the appearance of a gnat (Chironomus) attacked by the Empusa form of *Entomophthora rimosa*, and incidentally alludes to *E. conglomerata* of the mosquito. Finally M. Giard refers to the enormous services which Entomophthora renders to agriculture. "Nothing could be more easy than to multiply these parasites, and to introduce them into places where they had not hitherto existed." The caterpillars of the cabbage butterfly can be exterminated by watering them with water containing the spores of *E. sphærosperma*. By collecting, in winter, these caterpillars, mummified and filled with spores, they can be used in destroying the hordes of caterpillars of the next summer. Giard also recommends destroying the cut-worm by sprinkling over cabbage beds water holding the spores of the fungus in suspension.—Some peculiarities in the anthers of Clethra are described, by C. R. Barnes, in the *Botanical Gazette* for August and September.

ZOOLOGY.¹

EGGS OF THE TREE CRICKET WANTED.—The undersigned would be much obliged for specimens of the eggs of the tree cricket (*Œcanthus*). They are laid in the terminal branches of the raspberry, plum, oak, grape, and almost any shrubs. The rows of punctures made by the ovipositor of the female are quite easily detected, and may be found during the Autumn and Winter. Send twigs by mail.—A. S. Packard, Jr., Providence, R. I.

DO FLYING FISH FLY—In the September number of the NATURALIST is a very interesting article on the subject, "Do Flying Fish Fly?" During the past summer I have been enabled to witness the flight of a good many flying fish of the large species

¹The departments of Ornithology and Mammalogy are conducted by Dr. ELLIOTT COUES, U. S. A.